The cause of the pink colour of the acid noticed by Mr. Crompton and others was investigated, and found to be permanganic acid, formed probably from the manganese present in commercial lead.

In conclusion, the author points out:—

That "peroxides" are found in appreciable quantities in the electrolyte during charge and discharge;

That their influence must not be neglected in considering the behaviour of the Planté cell;

And that it is to the electrolyte rather than to the plates that attention must be directed if any considerable improvement is to be effected.

IV. "A Study of the Planté Lead-Sulphuric Acid-Lead Peroxide Cell, from a Chemical Stand-point. Part II.—A Discussion of the Chemical Changes occurring in the Cell." By H. E. ARMSTRONG, F.R.S., and G. H. ROBERTSON. Received June 4, 1891.

(Abstract.)

The authors arrive in this paper at the following conclusions:—

1. That the cooling observed in the Planté cell can only be explained as resulting from the dissociation of the dilute sulphuric acid; and as the values given by Messrs. Ayrton, Lamb, Smith, and Woods are in practical agreement with those calculated on the assumption that the acid used is sulphuric acid itself, H_2SO_4, that in all probability such acid and not the dilute acid contained in the cell is operative throughout.

2. That the observed loss in efficiency cannot be due to temperature changes, as these arise through actions occurring out of circuit.

3. That it is difficult from a comparison of calculated with observed values of the E.M.F. to arrive at any final conclusion as to the exact nature of the changes which take place in the cell. On the assumption that sulphating occurs at both plates in circuit and under the influence of H_2SO_4, the calculated value is considerably too high; while, if sulphating occur only at the lead plate, the value calculated is far too low.

4. That a counter E.M.F. of about 0·5 volt would account for the observed departure from the highest calculated value. As peroxides are always present in the electrolyte, it is conceivable that such a counter E.M.F. may exist; moreover, there is also the possible influence of the lead support to be considered.

5. That the observed loss of efficiency is to be attributed to the formation of peroxides in the electrolyte, and to the excessive sulphating occurring chiefly at the peroxide plate in the local circuit existing between the support and the paste.